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POSSIBILITY OF MOLECULAR COMPLEXATION OF AMMONIUM GLYCYRRHIZATE WITH CHOLESTEROL IN AQUEOUS ETHANOL

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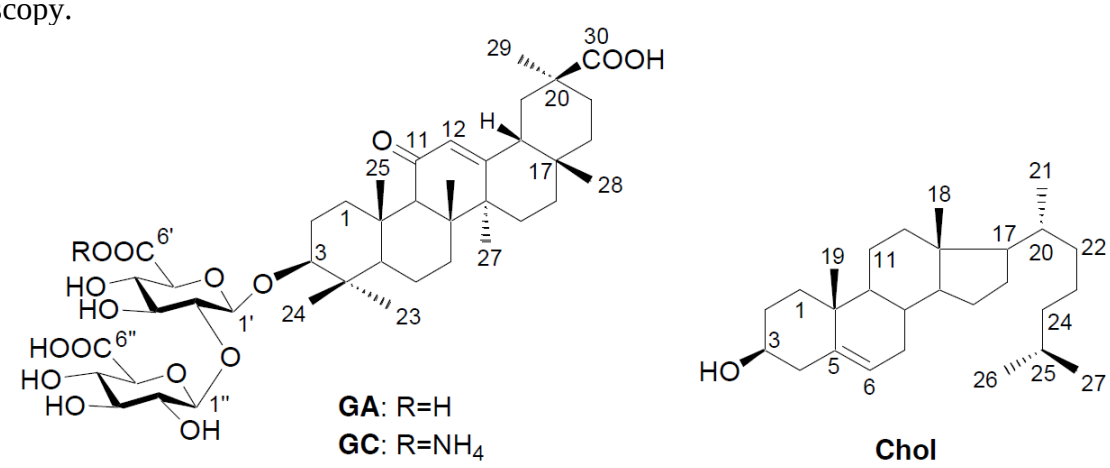
Abstract. Glycyrrhizic acid (GA) is the dominant triterpene glycoside from licorice roots *Glycyrrhiza glabra* L. (Fabaceae).[1] The most important derivative of GA is its monoammonium salt (glycyram, GC). GC is used in medical practice as an anti-inflammatory, hepatoprotective, antiallergic, and antitussive drug.

A characteristic feature of triterpene and steroid glycosides is their ability to form molecular complexes with sterols.[1–3] Some biological properties of saponins explain their molecular complexation with cholesterol (Chol).[1, 2] However, reported that GC and Chol do not form the molecular complex.[3]

To resolve the contradictions in the field of molecular complexation of triterpene glycoside GC with Chol, we considered their interaction in 80% aqueous ethanol. The complexation has been investigated by method of isomolar series in the spectrophotometric version and ATR IR-Fourier spectroscopy.



Stability constant of 1 : 1 complex $(1.6 \pm 0.4) \times 10^5$ $(mol/L)^{-1}$ was calculated based on isomolar curves at 25 °C (A.K. Babko method)[2].

Intermolecular interaction in the complex is carried out by hydrogen bond formation ($C{=}O_{GC}\ldots H{-}O_{Chol}$) and hydrophobic contacts. The results of this study can be used to modeling of the interaction of GA and GC with Chol in cell membranes and to study the mechanisms of the biological activity of saponins.

References

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